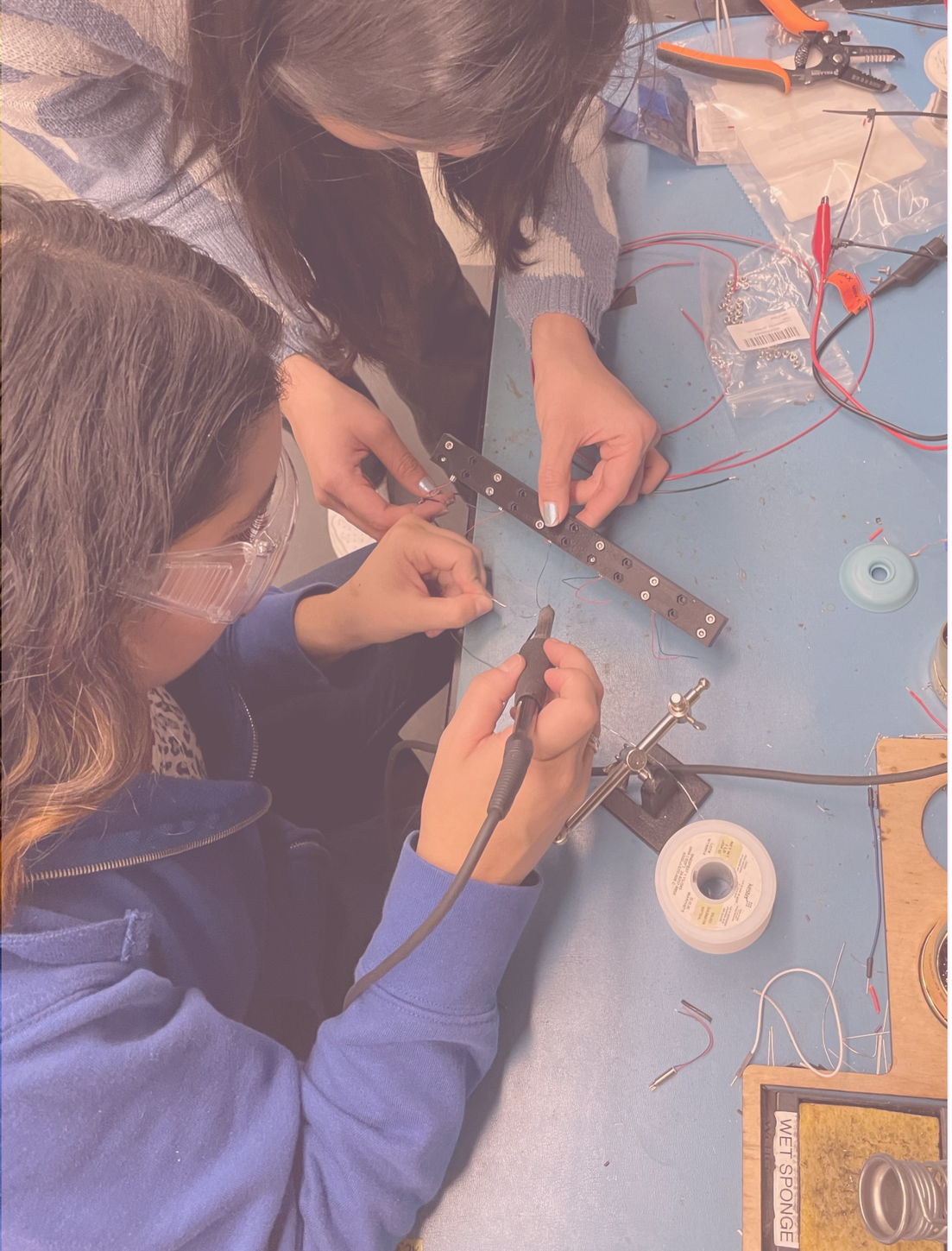

Portfolio

AMANDA MCGRAW

2023

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CURRICULUM VITAE

www.linkedin.com/in/amandamcgraw234/
amanda_mcgraw@berkeley.edu
+1 (845) 545-6035

EXPERIENCE

nSight Surgical — Jun 2023 - Aug 2023
Industrial Engineering Intern — Hybrid

L3Harris Technologies — May 2022 - Aug 2022
Continuous Improvement Intern — Melbourne, FL

Parlor City Furniture — Jan 2022 - May 2022
Automation Design Intern — Binghamton, NY

L3Harris Technologies — May 2021 - Aug 2021
Continuous Improvement Intern — Clifton, NJ

Binghamton Athletics — Aug 2018 - May 2022
ESPN Production Assistant — Binghamton, NY

SKILLS

AutoCAD / Fusion360 / Creo / SolidWorks / 3D Printing / Laser Cutting / Arena Simio / Minitab / Python / MATLAB / Adobe Creative Cloud / Tableau / LSSGB

EDUCATION

University of California, Berkeley
Master of Design, College of Engineering and Environmental Design

Binghamton University, State University of New York
Bachelor of Science in Industrial Engineering and Environmental Design,
Watson College of Engineering and Applied Sciences

PERSONAL

UC Berkeley Enabletech Edgesensing Team Co-lead
Binghamton University Swimming and Diving 2021-2022 Team Captain
Binghamton University IISE 2021-2022 Public Relations Chair
Binghamton University SWE 2020-2022 Membership and Alumni
Athletics: Gymnastics (10 yrs), Springboard diving (7 yrs), Taekwondo (black belt)

PUBLICATION

Publication accepted to ISER: *Gee, N., McGraw, A., Hillel, D., Bergfeld, L. (2022) "Toward Industry 4.0 Surface Mount Technology: Smart Manufacturing in Stencil Printing Operations". West Point, NY: Industrial and Systems Engineering Review Vol. 10 No. 2.*

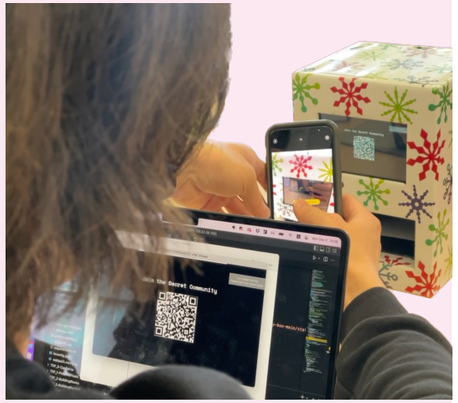
01. Secret Reality

The design is a platform for UC Berkeley students to share messages about subjects that are taboo from their point of view.

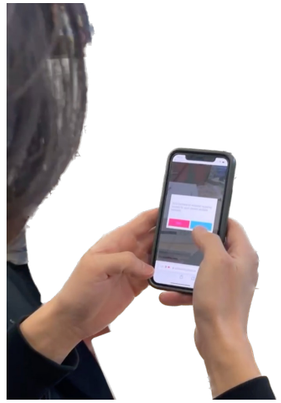
Figure #1:
Final Design Showcase Interactive Design

Figure #2:
Final Design User Experience

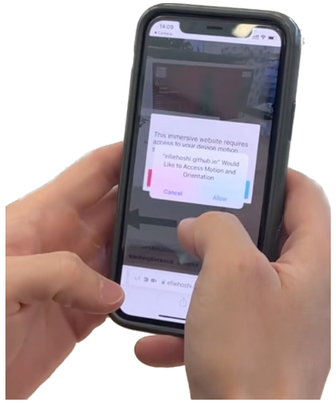
User Experience



Scan QR Code



Allow access to device motion your device motion sensors



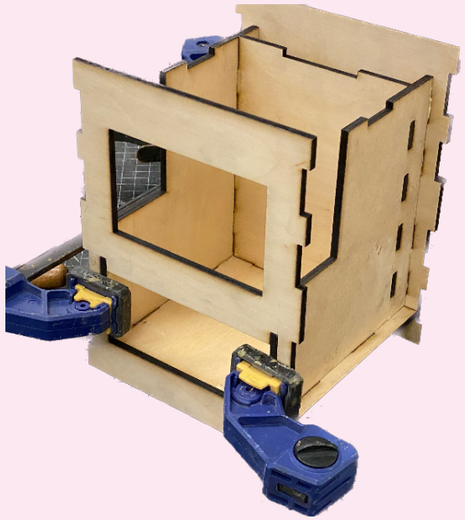
Allow access to motion and orientation

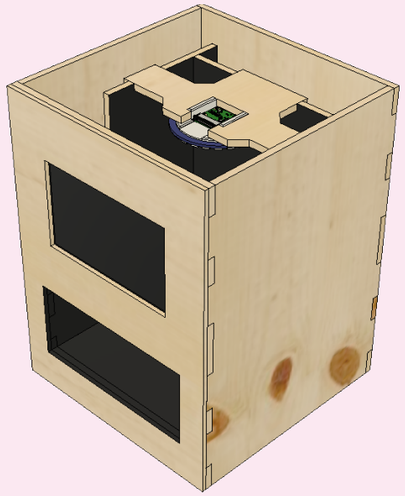
Activate Augmented Reality feature and output data from another user

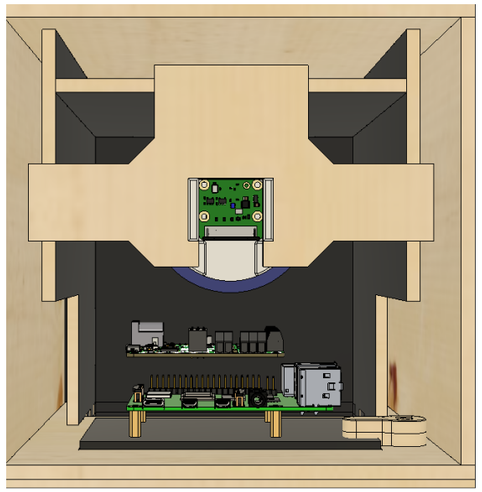
Fabrication

The hardware and software utilizes a Raspberry Pi and camera, fabricated to collect handwritten messages to import into an anonymous database.

The system is capable of using Optical Character Recognition (OCR) to store data anonymously in the box.







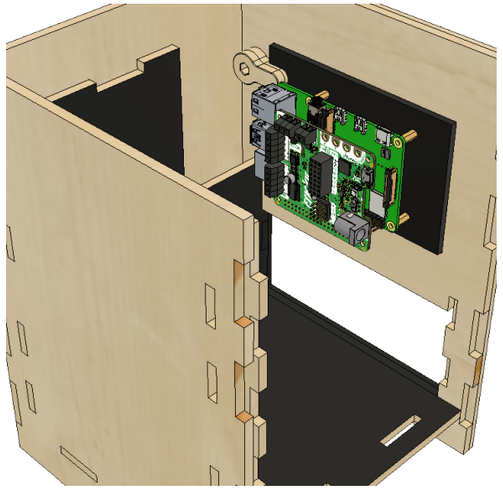


Figure #1: Fabricated box with clamps

Figure #2 : Rendered Model, Front View

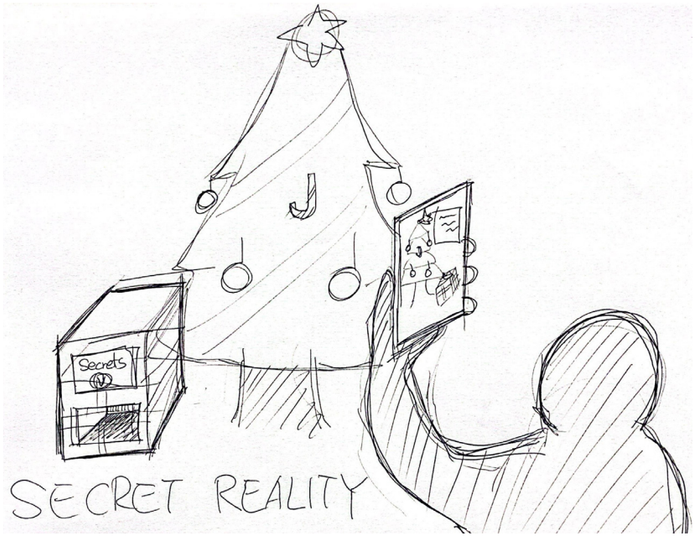
Figure #3 : Rendered Model, Top View

Figure #4 : Rendered Model, Open Back View

Product Demo

Scan #1

Scan #2



02. Edgesensing

The design includes a LiDar time-of-flight sensor and vibration motors to alert a user who is legally blind with detecting steep changes in elevation from a wheelchair.

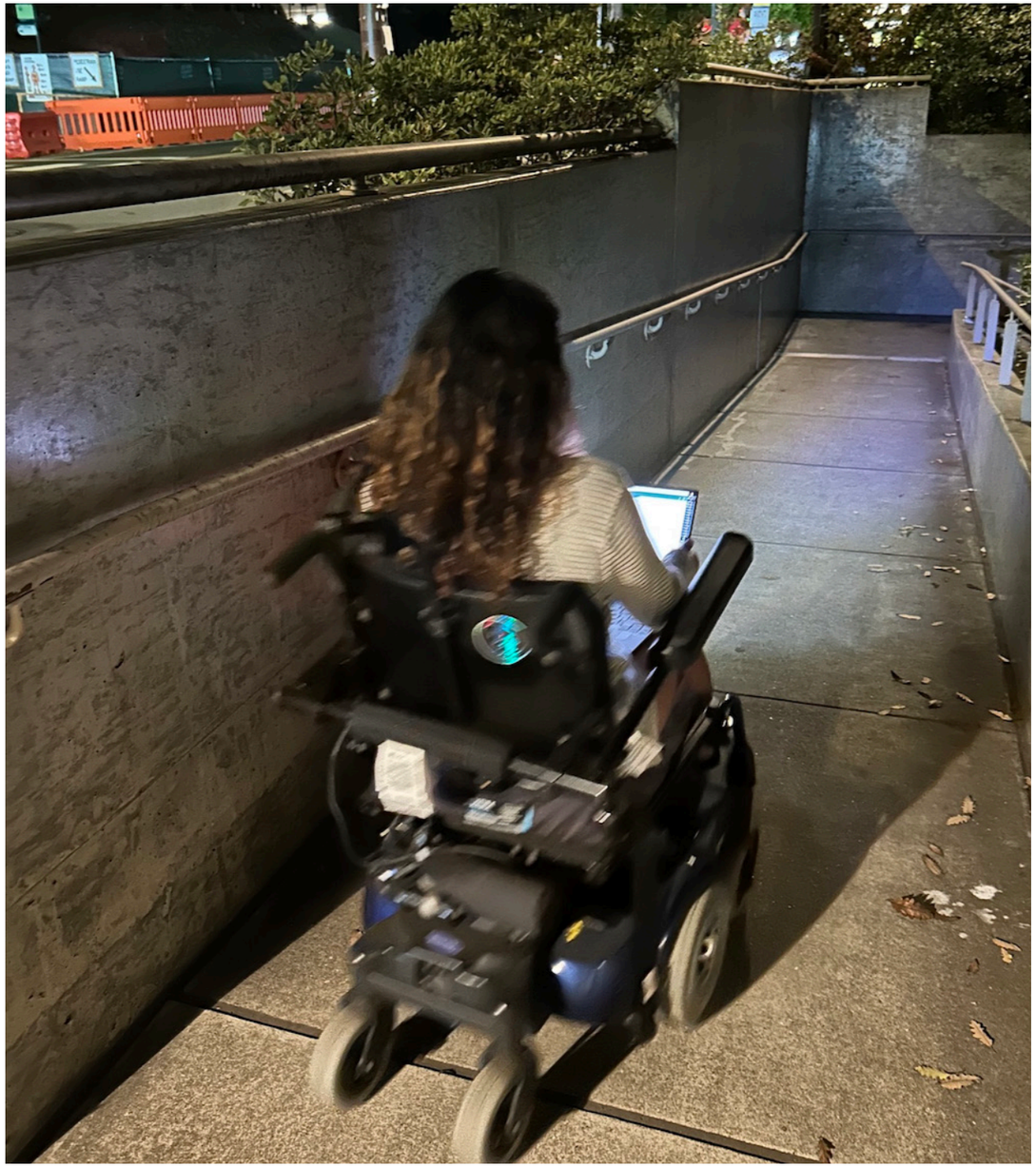


Figure #1

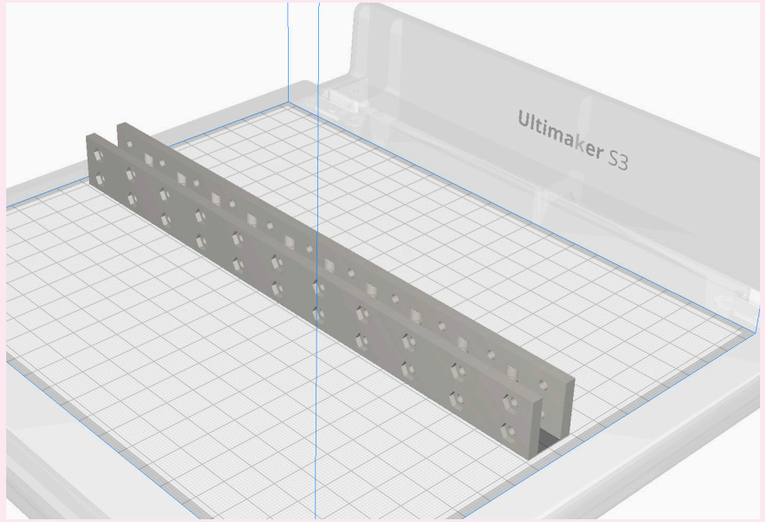


Figure #2

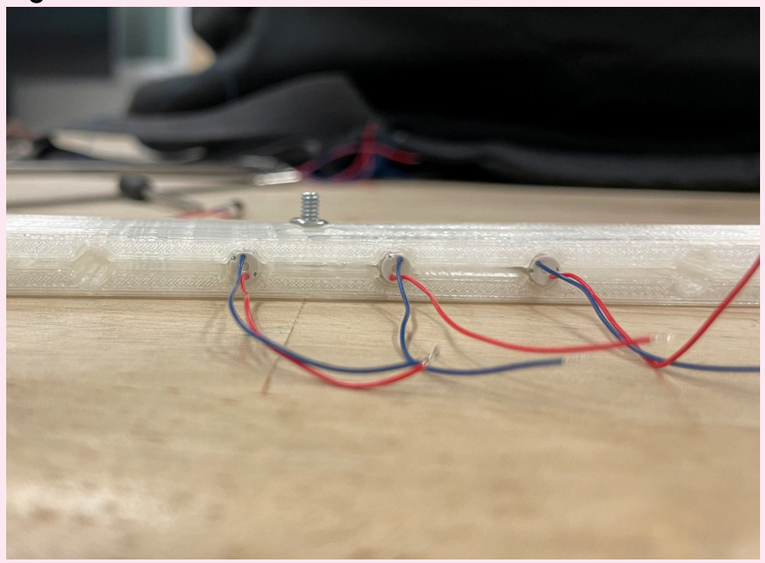


Figure #3

Figure #4

3D Casing

The 3D case is designed to secure the vibration motors and mount onto the armrest of a wheelchair. The modeling was done on Fusion 360 and printed with an UltiMaker Cura Printer.

Figure #2:
Vibration Motor Case being 3D-printed

Figure #3:
Case Holding Vibration Motors

Figure #4:
Setting up parameters for a fine print

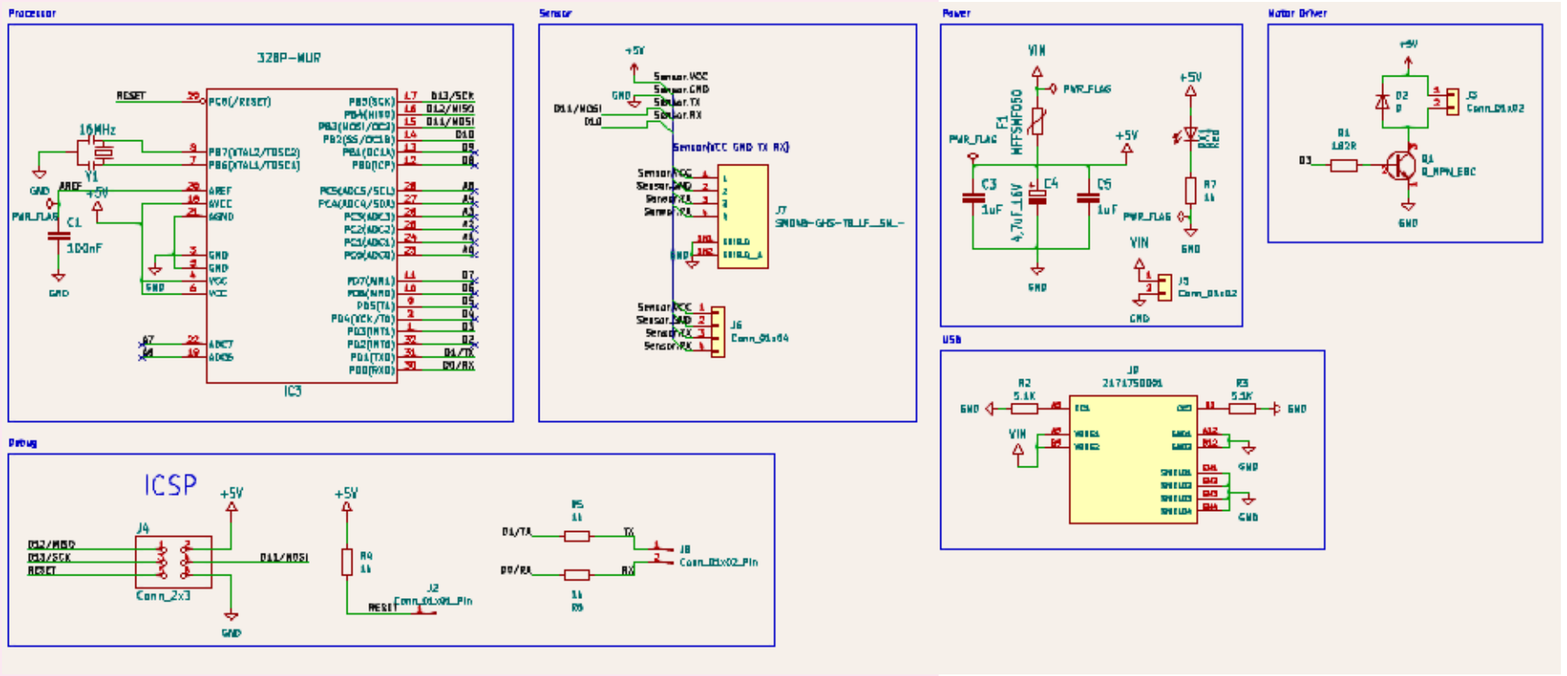


Figure #5

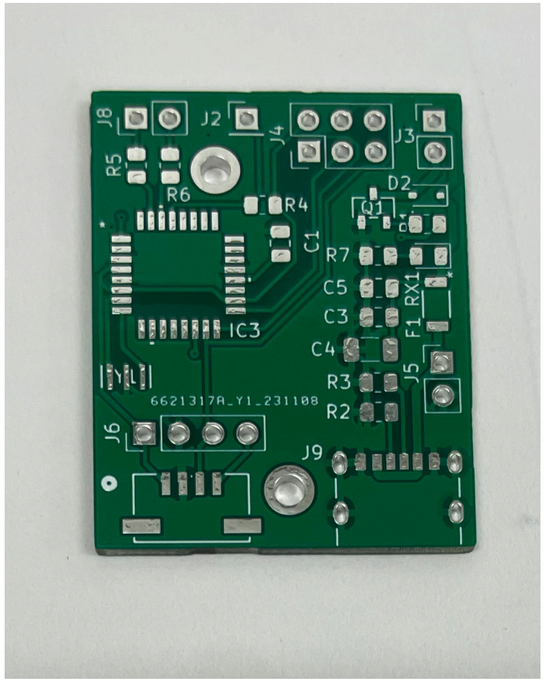


Figure #6

Printed Circuit Board Design

With a LiDAR time-of-flight (ToF) sensor, the system will trigger vibration motors when there is a steep change in elevation.

Figure #5: Schematic

Figure #6: Printed Circuit Board

Figure #7: Rendered PCB

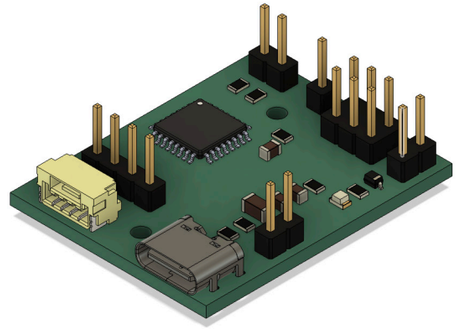


Figure #7

User Testing

By testing with a project partner, we learned how the previous LiDAR sensor provided a lot of data fairly reliably, but sometimes it encountered issues such as a reflective surface or too long of a distance, causing the sensor to send a false negative value. After modifying the code to ignore this erroneous data and adding some filtering, accuracy improved significantly.

03. nSight Surgical Internship

Over one summer, facilitated the development of a data visualization platform as well as taught the team Lean Six Sigma techniques.

DISCLAIMER:
I cannot share much information about the work due to NDA.

04. Phantoms for Magnetic Resonance Imaging (MRI)

Physical reference object “phantoms” that mimic anatomic behavior of certain brain tissues are intended for calibration in MRI machines. This phantom is 3D printed out of castable wax resin, including compartments for uv gels that mimic quantitative MRI parameters (T1, T2) for White Matter, Gray Matter, and Cerebralspinal Fluid in the brain.

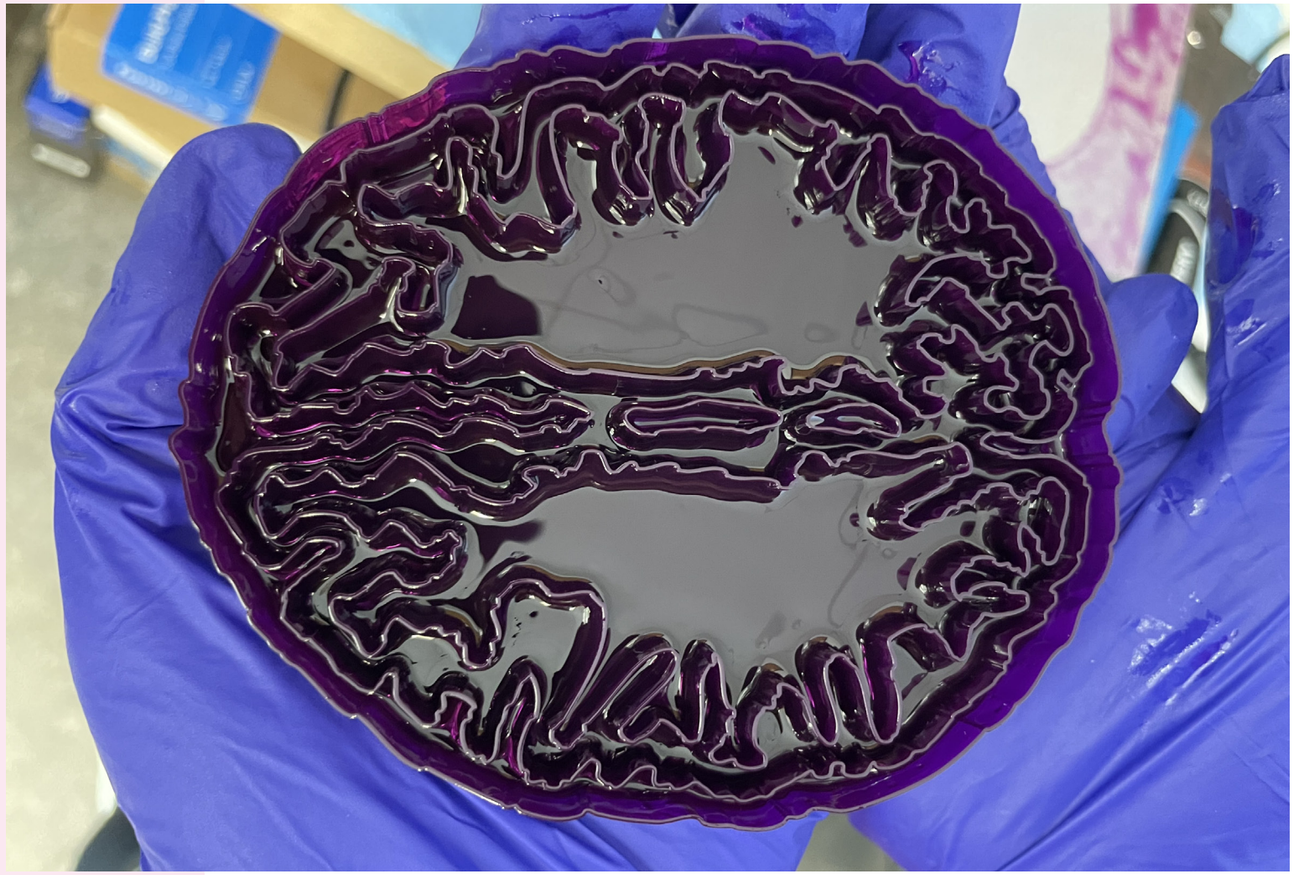


Figure #1 : Castable Wax Resin Brain Slice Phantom during 3D-Printing Process

PHANTOMS FOR MAGNETIC RESONANCE IMAGING (MRI)

Motivation

Variability and heterogeneities among MRI hardware and protocols hinders quantitative imaging. Standardized anatomy-mimicking phantoms provide the missing reference data to enable reproducible scans for biomarker discovery, precision medicine, academic research, and several other implications.

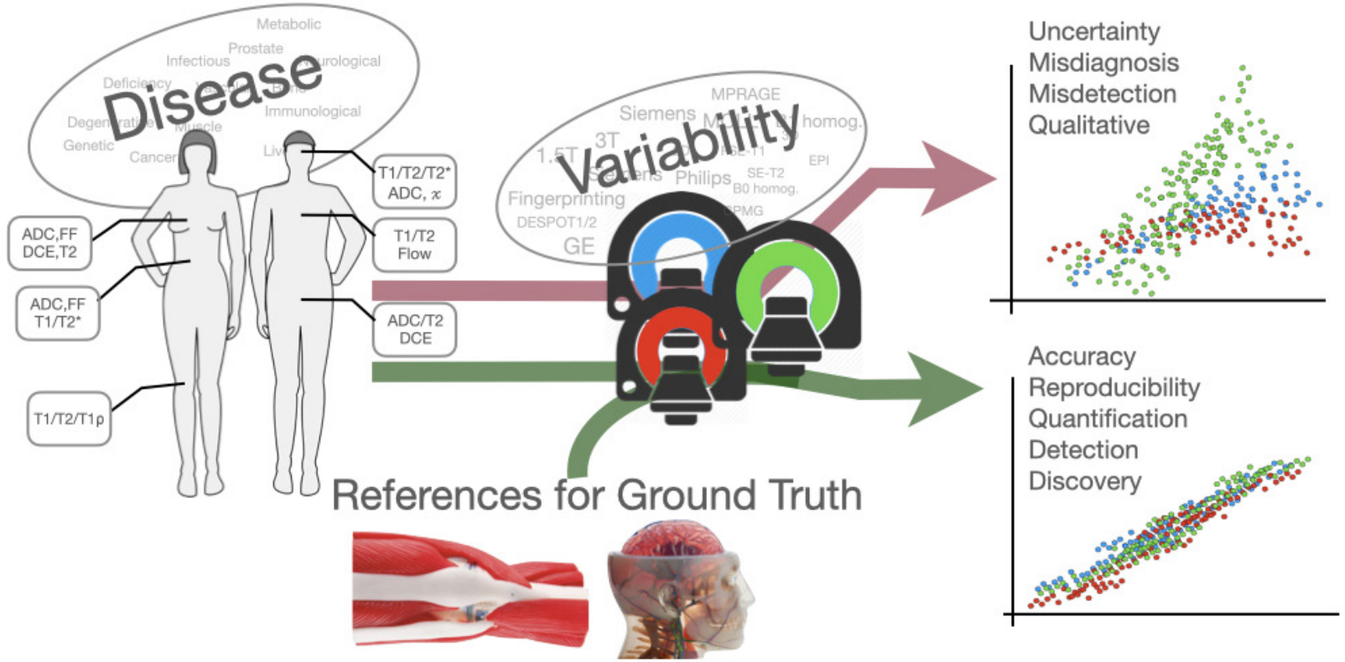


Figure #2:
Motivations for quantitative anatomy-mimicking brain slice phantoms
Source: Michael Lustig, UC Berkeley

PHANTOMS FOR MAGNETIC RESONANCE IMAGING (MRI)

By imaging different resin materials in the MRI, this led to the design decision to 3D print the models with castable wax resins. Other materials showed a concave meniscus in the UV-curable hydrogels utilized to mimic the tissue behavior.

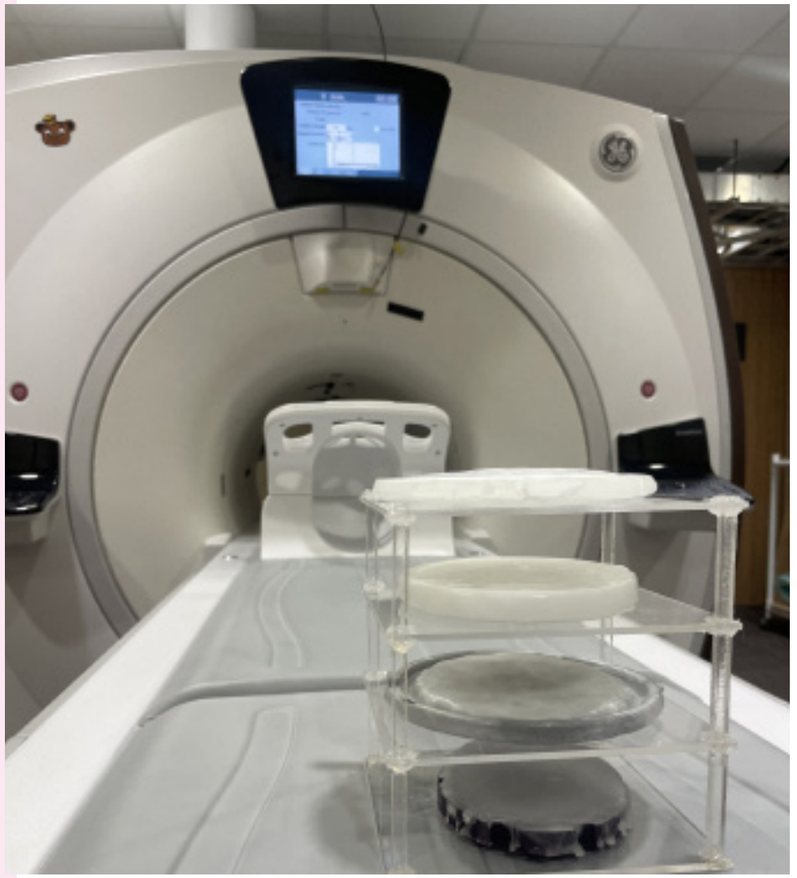


Figure #3 :
Four slice phantoms made from different stereolithography materials, filled with UV-curable hydrogels and seals with paraffin wax on an acrylic multi-slice setup

Thank you

Amanda
Mc
Graw